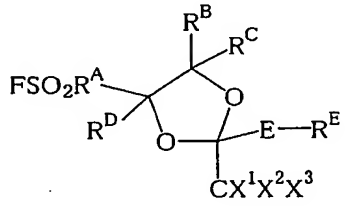
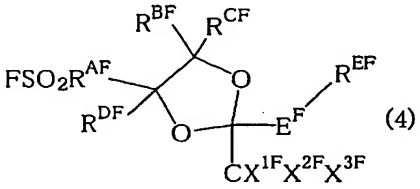
WHAT IS CLAIMED IS:

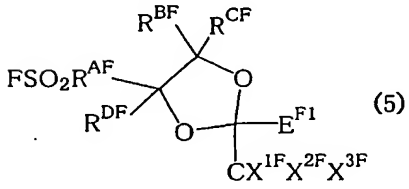
1. A process for producing the following fluorosulfonyl group-containing compound (5), characterized in that the following compound (3) is fluorinated to form the following compound (4), and then, the compound (4) is subjected to a decomposition reaction:



(3)



(4)



(5)

provided that the symbols in the formulae have the following meanings:

At least one selected from R^A to R^E, X^1 to X^3 and E is a hydrogen atom or a group having hydrogen atom(s), and at least one selected from R^{AF} to R^{EF}, X^{1F} to X^{3F} and E^F is a fluorinated group or a fluorine atom;

R^A: a bivalent organic group;

R^{AF}: a group corresponding to R^A, i.e. a bivalent organic group having R^A fluorinated, or the same bivalent organic group as R^A;

R^B, R^C, R^D: each independently being a hydrogen atom, a halogen atom or a monovalent organic group;

R^{BF}, R^{CF}, R^{DF}: R^{BF}, R^{CF} and R^{DF} are groups which

correspond to R^B, R^C and R^D, respectively; when any one of R^B to R^D is a hydrogen atom, the one of R^{BF} to R^{DF} corresponding to the hydrogen atom is a hydrogen atom or a fluorine atom; when any one of R^B to R^D is a halogen atom, the one of R^{BF} to R^{DF} corresponding to the halogen atom is a halogen atom; when any one of R^B to R^D is a monovalent organic group, the one of R^{BF} to R^{DF} corresponding to the monovalent organic group is a monovalent organic group having the corresponding one of R^B to R^D fluorinated, or the same group as the corresponding one of R^B to R^D;

R^E: a monovalent organic group;

R^{EF}: a group corresponding to R^E, i.e. a monovalent organic group having R^E fluorinated, or the same monovalent organic group as R^E;

E: a bivalent connecting group;

E^F: a group corresponding to E, i.e. the same bivalent connecting group as E, or a bivalent connecting group having E fluorinated;

E^{F1}: a group formed by scission of E^F;

X^1, X^2, X^3: each independently being a hydrogen atom, a chlorine atom, or a fluorine atom;

X^{1F}, X^{2F}, X^{3F}: X^{1F}, X^{2F} and X^{3F} correspond to X^1, X^2, X^3, respectively; when any one of X^1 to X^3 is a hydrogen atom, the one of X^{1F} to X^{3F} corresponding to the hydrogen atom, is a hydrogen atom or a fluorine atom; when any one of X^1 to X^3 is a fluorine atom, the one of X^{1F} to X^{3F}

corresponding to the fluorine atom, is a fluorine atom; and when any one of X^1 to X^3 is a chlorine atom, the one of X^{1F} to X^{3F} corresponding to the chlorine atom, is a chlorine atom.

2. The process according to Claim 1, wherein the fluorination reaction is carried out by the reaction with fluorine in a liquid phase.

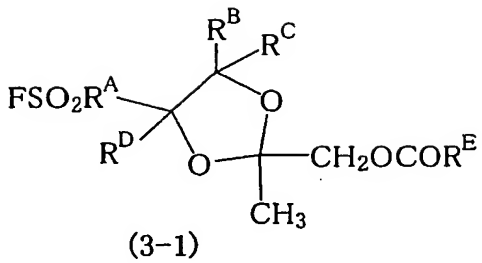
3. The process according to Claim 2, wherein the fluorine content of the compound (3) is from 20 to 86 mass%.

4. The process according to Claim 2, wherein the molecular weight of the compound (3) is from 200 to 1,000.

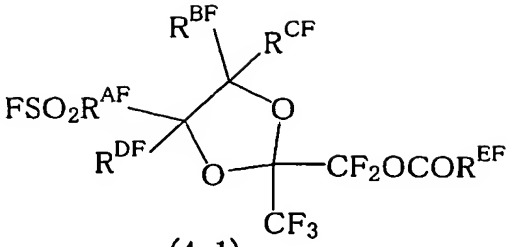
5. The process according to Claim 1, wherein R^E is a perfluorinated monovalent organic group, and R^{EF} is the same group as R^E.

6. The process according to Claim 1, wherein the fluorination is a reaction whereby the compound (3) is substantially perfluorinated.

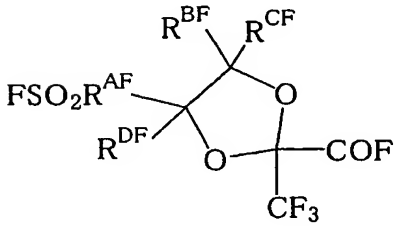
7. The process according to Claim 1, wherein the compound (3) is the following compound (3-1), the compound (4) is the following compound (4-1), and the compound (5) is the following compound (5-1):



(3-1)



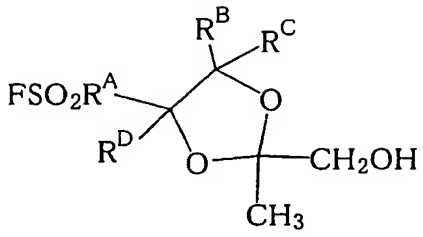
(4-1)



(5-1)

provided that the symbols in the formulae have the same meanings as defined above.

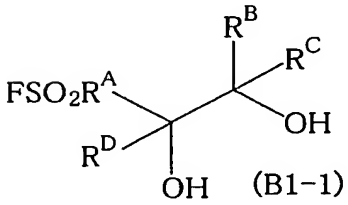
8. The process according to Claim 7, wherein the compound (3-1) is a reaction product of the following compound (A1-1) and the following compound (A2-1), a reaction product of the following compound (B1-1) and the following compound (B2-1), or a reaction product obtained by reacting the following compound (C1-1) with acetone to form the following compound (C1-2) and reacting the compound (C1-2) and the following compound (B2-1):



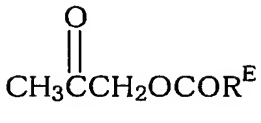
(A1-1)

R^ECOF

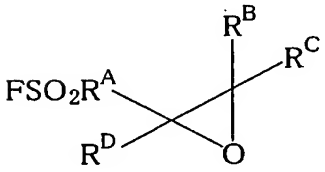
(A2-1)



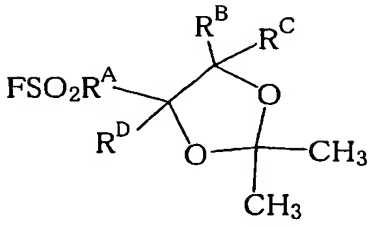
(B1-1)



(B2-1)



(C1-1)

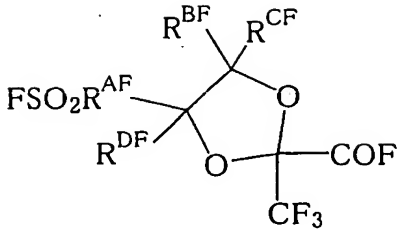


(C1-2)

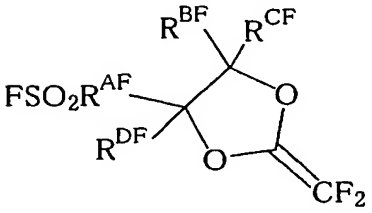
provided that the symbols in the formulae have the same meanings as defined above.

9. The process according to Claim 8, wherein the compound (3-1) is a compound obtained by reacting the compound (C1-1) with acetone to obtain a reaction product containing the compound (C1-2) and acetone, and using the reaction product as it contains the acetone, for the reaction with the compound (B2-1).

10. A process for producing the following compound (7-1), characterized in that the following compound (5-1) is thermally decomposed:



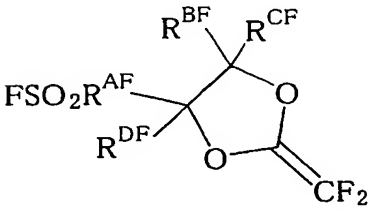
(5-1)



(7-1)

provided that the symbols in the formulae have the same meanings as defined above.

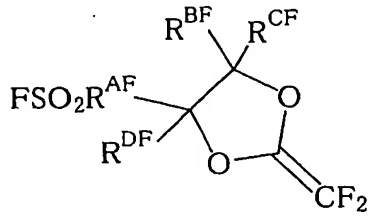
11. A process for producing a fluorosulfonyl group-containing polymer, characterized by polymerizing at least one member of the following compound (7-1), or at least one member of the following compound (7-1) and at least one member of a polymerizable monomer which is copolymerizable with the compound (7-1):



(7-1)

12. A fluorosulfonyl group-containing polymer, comprising monomer units having polymerized at least one member of the following compound (7-1), or monomer units having polymerized at least one member of the following compound

(7-1) and monomer units having polymerized at least one member of a polymerizable monomer which is copolymerizable with the compound (7-1):

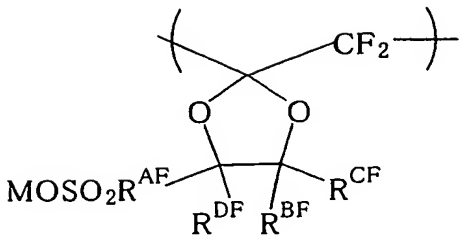


(7-1)

13. The fluorosulfonyl group-containing polymer according to Claim 12, which has a molecular weight of from 5×10^3 to 5×10^6 and contains from 0.1 to 99.9 mol% of the monomer units having polymerized at least one member of a polymerizable monomer which is copolymerizable with the compound (7-1).

14. A process for producing a sulfonate or sulfonic group-containing polymer, characterized in that fluorosulfonyl groups of the fluorosulfonyl group-containing polymer produced by the process of Claim 11, are subjected to alkali hydrolysis, or to such alkali hydrolysis, followed by acid treatment.

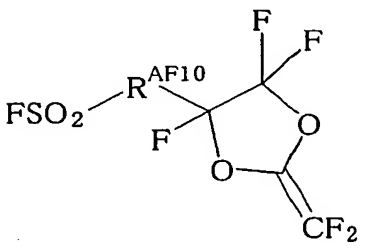
15. A fluorosulfonic group-containing polymer comprising monomer units represented by the following formula, or such monomer units and monomer units of another monomer which is copolymerizable with such monomer units:



wherein M is a hydrogen atom or a counter ion.

16. The fluorosulfonic group-containing polymer according to Claim 15, which has a molecular weight of from 5×10^3 to 5×10^6 and contains from 0.1 to 99.9 mol% of the monomer units of another copolymerizable monomer.

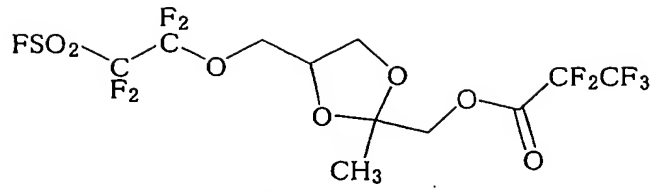
17. A compound represented by the following formula (7-1A):



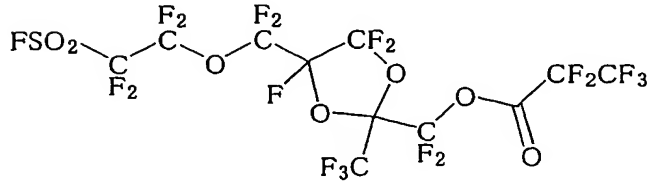
(7-1A)

wherein R^{AF10} is a C_{1-20} perfluoroalkylene group or a C_{1-20} perfluoro(etheric oxygen atom-containing alkylene) group.

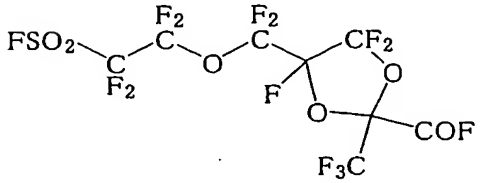
18. Any one of the compounds represented by the following formulae, wherein M^2 is an alkali metal ion:



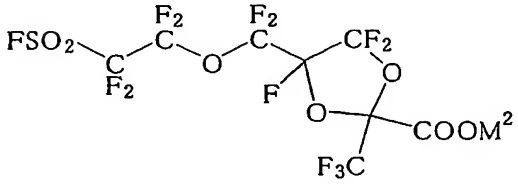
(3-10)



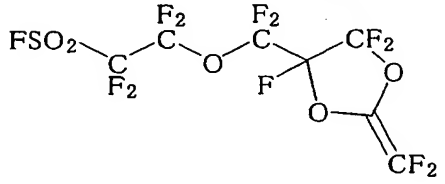
(4-10)



(5-10)



(6-10)



(7-10)